



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,620	10/22/2003	De-Ling Zhou	60937-0140-US	4821
20582	7590	06/24/2005	EXAMINER	
JONES DAY			WEBB, GREGORY E	
51 Louisiana Aveue, N.W				
WASHINGTON, DC 20001-2113			ART UNIT	
			PAPER NUMBER	
			1751	
DATE MAILED: 06/24/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/689,620

Applicant(s)

ZHOU ET AL.

Examiner

Gregory E. Webb

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/31/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION*****Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,319,885. Although the conflicting claims are not identical, they are not patentably distinct from each other because each of the cases requires the inclusion of a hydroxylamine derivatives, solvents, and a corrosion inhibitor as required by the instant claims.

Claims 1-39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,319,885. Although the conflicting claims are not identical, they are not patentably distinct from each other because each of the cases requires the inclusion of a hydroxylamine derivatives, solvents, and a corrosion inhibitor as required by the instant claims.

Claims 1-39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,492,311. Although the conflicting claims are not identical, they are not patentably distinct from each other because each

Art Unit: 1751

of the cases requires the inclusion of a hydroxylamine derivatives, solvents, and a corrosion inhibitor as required by the instant claims.

Claims 1-39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 6,777,380. Although the conflicting claims are not identical, they are not patentably distinct from each other because each of the cases requires the inclusion of a hydroxylamine derivatives, solvents, and a corrosion inhibitor as required by the instant claims.

Claims 1-39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,110,881. Although the conflicting claims are not identical, they are not patentably distinct from each other because each of the cases requires the inclusion of a hydroxylamine derivatives, solvents, and a corrosion inhibitor as required by the instant claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Art Unit: 1751

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikemoto (US6372410).

Concerning the claimed hydroxylamine derivative and the claimed HF-base salts, Ikemoto teaches the following:

The fluorine compounds usable in the present invention are hydrofluoric acid, ammonium fluorides and amine hydrofluorides including ammonium fluoride, acid ammonium fluoride, methylamine hydrofluoride, ethylamine hydrofluoride, propylamine hydrofluoride, tetramethylammonium fluoride, tetraethylammonium fluoride, ethanolamine hydrofluoride, methylethanolamine hydrofluoride, dimethylethanolamine hydrofluoride, hydroxylamine hydrofluoride, dimethylhydroxylamine hydrofluoride, triethylenediamine hydrofluoride, etc. Of these fluorine compounds, ammonium fluoride and tetramethylammonium fluoride are preferred, and ammonium fluoride is more preferred. These fluorine compounds may be used alone or in combination of two or more.(see cols. 2-3)

Concerning the claimed quaternary ammonium salts suitable for use, Ikemoto teaches the following:

Art Unit: 1751

9. The resist stripping composition according to claim 8, wherein the corrosion inhibitor includes at least one of the quaternary ammonium salts.(see claim 9)

Concerning the polar organic solvent, Ikemoto teaches the following:

6. The resist stripping composition according to claim 5, wherein said at least one glycol ether is selected from the group consisting of ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, ethylene glycol dimethyl ether, ethylene glycol diethyl ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monopropyl ether, diethylene glycol monoisopropyl ether, diethylene glycol monobutyl ether, diethylene glycol monoisobutyl ether, diethylene glycol monobenzyl ether, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, triethylene glycol monomethyl ether, triethylene glycol dimethyl ether, polyethylene glycol monomethyl ether, diethylene glycol methyl ethyl ether, triethylene glycol, ethylene glycol monomethyl ether acetate, ethylene glycol monoethyl ether acetate, propylene glycol monomethyl ether, propylene glycol dimethyl ether, propylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol monopropyl ether, dipropylene glycol monoisopropyl ether, dipropylene glycol monobutyl ether, dipropylene glycol dimethyl ether, dipropylene glycol dipropyl ether, dipropylene glycol diisopropyl

Art Unit: 1751

ether, tripropylene glycol and tripropylene glycol monomethyl ether.(see col. 3, lines 18-50 and claim 6)

Concerning the claimed corrosion inhibitor, Ikemoto teaches the following:

The resist stripping composition according to the present invention may further contain a corrosion inhibitor, which may include aromatic hydroxy compounds such as catechol, phenols and pyrogallol; carboxyl-containing organic compounds such as formic acid, acetic acid, propionic acid, butyric acid, isobutyric acid, oxalic acid, malonic acid, succinic acid, glutaric acid, maleic acid, fumaric acid, benzoic acid, phthalic acid, 1,2,3-benzenetricarboxylic acid, glycolic acid, lactic acid, malic acid, citric acid, acetic anhydride, phthalic anhydride, maleic anhydride, succinic anhydride and salicylic acid; organic salts of carboxyl-containing organic compounds derived from the carboxyl-containing organic compounds recited above and basic substances such as ethanolamine, trimethylamine, diethylamine and pyridine; and chelate compounds such as phosphoric acid-based chelate compounds such as 1,2-propanediaminetetramethylene phosphonic acid and hydroxyethane phosphonic acid, carboxylic acid-based chelate compounds such as ethylenediaminetetraacetic acid, dihydroxyethylglycine and nitrilotriacetic acid, amine-based chelate compounds such as bipyridine, tetraphenylporphyrin and phenanthroline, and oxime-based chelate compounds such as dimethylglyoxime and diphenylglyoxime.(see col. 4, lines 7-30)

Art Unit: 1751

Concerning the alternative corrosion inhibitors, Ikemoto teaches the following:

13. The resist stripping composition according to claim 12, wherein the corrosion inhibitor includes at least one of the phosphoric acid-based chelate compounds.(see claim 13)

Concerning the preferred substrate, Ikemoto teaches the following:

23. A process for producing a semiconductor device, comprising:(see claim 23)

Claims 1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Honda (US5798323).

Concerning the claimed hydroxylamine derivative, Honda teaches the following:

As stated above, the non-corrosive stripping and cleaning composition of the present invention has four components, namely one or more selected polar solvents, one or more selected alkanolamine compounds, one or more selected corrosion inhibitors; and water. These four components must be present in certain percentages. Also, the present invention is preferably free of hydroxylamine compounds such as hydroxylamine or N,N-diethylhydroxylamine.(see col. 5, lines 15-25)

Concerning the claimed quaternary ammonium salts suitable for use, Honda teaches the following:

Several different chemistries have been identified for removing the post-etch residues, particularly the metal oxide type. For example,



Art Unit: 1751

alkaline aqueous developers such as those containing tetramethylammonium hydroxide (TMAH) are known to attack aluminum. Thus, an aluminum oxide residue can be etched away with TMAH. However, other types of the post-etch residues associated with multi-metal systems such as Al/Si/Cu cannot be so easily removed with TMAH. TMAH also is ineffective on residues from polysilicon plasma etch processes.(see cols. 1-2)

Concerning the claimed two-carbon atom linkage alkanolamine compounds, Honda teaches the following:

- (b) about 10% to about 90% alkanolamine selected from the group consisting of diethyleneglycolamine, monoethanolamine, diethanolamine, triethanolamine, 2-(2-aminoethylamino)ethanol and admixtures thereof;(see claim 1)

Concerning the polar organic solvent, Honda teaches the following:

- (a) about 5% to about 50% of solvent selected from the group consisting of N-methyl-2-pyrrolidinone, N-hydroxyethyl-2-pyrrolidinone, 1,3-dimethyl-2-imidazolidinone, dimethylsulfoxide, N,N-dimethylacetamide, diacetone alcohol, ethylene glycol, propylene glycol and admixtures thereof;(see claim 1)

Concerning the claimed corrosion inhibitor, Honda teaches the following:

U.S. Pat. No. 5,563,119 to Ward discloses an aqueous stripping composition that is essentially free of any hydroxylamine compounds. The composition is an aqueous mixture of an alkanolamine, tetraalkylammonium hydroxide, and an inhibitor. Useful inhibitors are disclosed to be catechol,

Art Unit: 1751

pyrogallol, anthranilic acid, gallic acid, gallic esters, and the like.(see col. 3, lines 15-20)

Concerning the preferred substrate and intended use, Honda teaches the following:

As defined herein, the term "non-corrosive" refers to suppression of any chemical action that gradually wears away a substrate. The term "stripping and cleaning composition" refers to a composition that is able to both (1) remove or strip a photoresist (or other similar organic polymeric material) film or layer from a semiconductor substrate and (2) remove or clean various types of plasma-etch residues (also sometimes called plasma side wall polymers) from a semiconductor substrate.(see col. 5, lines 5-15)

Claims 1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe (US5968848).

Concerning the claimed hydroxylamine derivative, claimed quaternary ammonium salts suitable for use and the claimed two-carbon atom linkage alkanolamine compounds, Tanabe teaches the following:

Typical examples of hydroxylamines include hydroxylamine and N,N-diethylhydroxylamine. Typical examples of primary aliphatic amines include monoethanolamine, ethylenediamine, and 2-(2-aminoethylamino)ethanol. Typical examples of secondary amines include diethanolamine, dipropylamine, and 2-ethylaminoethanol. Typical examples of tertiary amines include dimethylaminoethanol, and ethyldiethanolamine. Typical examples of alicyclic amines include cyclohexylamine, and dicyclohexylamine. Typical examples of aromatic amines include

Art Unit: 1751

benzylamine, dibenzylamine, and N-methylbenzylamine. Typical examples of heterocyclic amines include pyrrole, pyrrolidine, pyrrolidone, pyridine, morpholine, pyrazine, piperidine, N-hydroxyethylpiperidine, oxazole, and thiazole. Further, typical examples of lower-alkyl quaternary ammonium bases include tetramethylammonium hydroxide, trimethyl(2-hydroxyethyl)ammonium hydroxide(choline). Among these, aqueous ammonia, monoethanolamine, and tetramethylammonium hydroxide are preferred since they can be easily obtained and are safer.(see col. 4, lines 29-48)

Concerning the polar organic solvent, Tanabe teaches the following:

polyhydric alcohols and derivatives thereof such as ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, ethylene glycol monomethyl ether acetate, ethylene glycol monoethyl ether acetate, diethylene glycol, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, and diethylene glycol monobutyl ether.(see col. 6, lines 25-35)

Concerning the claimed corrosion inhibitor, Tanabe teaches the following:

10. The process for treating a substrate according to claim 9, wherein said anticorrosive comprises at least one compound selected from the group consisting of pyrocatechol, 2-butyne-1,4-diol, benzotriazole, and D-sorbitol.(see claim 10)

Concerning the alternative corrosion inhibitors, Tanabe teaches the following:

Examples of triazole compounds include benzotriazole, o-tolyltriazole,

Art Unit: 1751

m-tolyltriazole, p-tolyltriazole, carboxybenzotriazole, 1-hydroxytriazole, nitrobenzotriazole, and dihydroxypropylbenzotriazole. Among these, benzotriazole is preferred.(see col. 7,lines 20-25)

Concerning the claimed HF-base salts, Tanabe teaches the following:

4. The process for treating a substrate according to claim 2 or 3, wherein said ingredient (a) is ammonium fluoride, and said ingredient (b) is dimethylsulfoxide.(see claim 4)

Claims 1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe (US6068000).

Concerning the claimed hydroxylamine derivative and the claimed two-carbon atom linkage alkanolamine compounds, Tanabe teaches the following:

Typically, examples of hydroxylamines include hydroxylamine and N,N-diethylhydroxylamine; examples of primary aliphatic amines include monoethanolamine, ethylenediamine, and 2-(2-aminoethylamino)ethanol; examples of secondary aliphatic amines include diethanolamine, dipropylamine, and 2-ethylaminoethanol; examples of tertiary aliphatic amines include dimethylaminoethanol, and ethyldiethanolamine; examples of alicyclic amines include cyclohexylamine, and dicyclohexylamine; examples of aromatic amines include benzylamine, dibenzylamine, and N-methylbenzylamine; and examples of heterocyclic amines include pyrrole, pyrrolidine, pyrrolidone, pyridine, morpholine, pyrazine, piperidine,

Art Unit: 1751

N-hydroxyethyl piperidine, oxazole, and thiazole. Further, typical examples of quaternary lower alkyl ammonium bases include tetramethylammonium hydroxide, and trimethyl(2-hydroxyethyl)ammonium hydroxide (choline). Among the above-listed compounds, aqueous ammonia, monoethanol amine and tetramethylammonium hydroxide are preferred since they are easily obtainable and superior in safety.(see cols 4-5)

Concerning the polar organic solvent, Tanabe teaches the following:

(b) at least one compound selected from the group consisting of dimethyl sulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, 1,3-dimethyl-2-imidazolidinone, ethylene glycol, and diethylene glycol monobutyl ether; (see claim 16)

Concerning the claimed corrosion inhibitor, Tanabe teaches the following:

9. The substrate treatment method according to claim 8, wherein said anticorrosive comprises at least one compound selected from the group consisting of catechol, 2-butyne-1,4-diol, benzotriazole, and D-sorbitol.(see claim 9)

Concerning the alternative corrosion inhibitors, Tanabe teaches the following:

Examples of triazoles include benzotriazole, o-tolyltriazole, m-tolyltriazole, p-tolyltriazole, carboxybenzotriazole, 1-hydroxybenzotriazole, nitrobenzotriazole, and dihydroxypropylbenzotriazole. Among these, benzotriazole is preferred.(see col. 4, lines 19-24)

Concerning the claimed HF-base salts, Tanabe teaches the following:

Art Unit: 1751

7. The substrate treatment method according to claim 1, wherein said remover solution principally containing a salt derived from hydrofluoric acid and a metal-free base is a remover solution for resists which comprises 0.2 to 10% by weight of ammonium fluoride, 30 to 90% by weight of dimethyl sulfoxide, and 5 to 50% by weight of water.(see claim 7)

Concerning the preferred substrate, Tanabe teaches the following:

A positive or negative resist composition is applied by a spin coating method, a roll coater method, a bar coater method or the like to a substrate such as a silicon wafer or a glass substrate used for a semiconductor device or a liquid-crystal panel device;(see col. 6, lines 45-65)

Claims 1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe (US6218087).

Concerning the claimed hydroxylamine derivative, Tanabe teaches the following:

Specific examples of the hydroxylamine include hydroxylamine (NH.sub.2 OH), N-methylhydroxylamine, N,N-dimethylhydroxylamine and N,N-diethylhydroxylamine, among which hydroxylamine (NH.sub.2 OH) is preferred. These hydroxylamines may be used either independently or in combination with themselves.(see col. 6, lines 46-55)

Concerning the claimed two-carbon atom linkage alkanolamine compounds, Tanabe teaches the following:

Exemplary amines include alkanolamines, such as monoethanolamine, diethanolamine, triethanolamine, 2-(2-aminoethoxy) ethanol,

Art Unit: 1751

N,N-dimethylethanolamine, N,N-diethylethanolamine, N,N-dibutylethanolamine, N-methylethanolamine, N-ethylethanolamine, N-butylethanolamine, N-methyldiethanolamine, monoisopropanolamine, diisopropanolamine and triisopropanolamine; polyalkylenepolyamines, such as diethylenetriamine, triethylenetetramine, propylenediamine, N,N-diethylethylenediamine, N,N'-diethylethylenediamine, 1,4-butanediamine, N-ethylethylenediamine, 1,2-propanediamine, 1,3-propanediamine and 1,6-hexanediamine; aliphatic amines, such as 2-ethylhexylamine, dioctylamine, tributylamine, tripropylamine, triallylamine, heptylamine and cyclohexylamine; aromatic amines, such as benzylamine and diphenylamine; and cyclic amines, such as piperazine, N-methylpiperazine, methylpiperazine and hydroxyethylpiperazine. Among these amines, monoethanolamine, 2-(2-aminoethoxy)ethanol, diethylenetriamine, triethylenetetramine, cyclohexylamine and piperazine are preferred from the viewpoint of corrosion inhibition and strippability. (see cols. 5-6)

Concerning the polar organic solvent, Tanabe teaches the following:

Examples of water-soluble organic solvents include sulfoxides, such as dimethyl sulfoxide; sulfones, such as dimethyl sulfone, diethyl sulfone, bis(2-hydroxyethyl)sulfone and tetramethylene sulfone; amides, such as N,N-dimethylformamide, N-methylformamide, N,N-dimethylacetamide, N-methylacetamide and N,N-diethylacetamide; lactams, such as

Art Unit: 1751

N-methyl-2-pyrrolidone, N-ethyl-2-pyrrolidone, N-propyl-2-pyrrolidone, N-hydroxymethyl-2-pyrrolidone and N-hydroxyethyl-2-pyrrolidone; imidazolidinones, such as 1,3-dimethyl-2-imidazolidinone, 1,3-diethyl-2-imidazolidinone and 1,3-diisopropyl-2-imidazolidinone; and polyhydric alcohols, such as ethylene glycol, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, ethylene glycol monomethyl ether acetate, ethylene glycol monoethyl ether acetate, diethylene glycol, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether and diethylene glycol monobutyl ether, and derivatives thereof. These organic solvents may be used alone or in combination with one another. Preferable among these examples are dimethylsulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, 1,3-dimethyl-2-imidazolidinone and diethylene glycol monobutyl ether, which effectively remove deteriorated photoresist films. Of these examples, dimethyl sulfoxide is particularly desirable because of its good anticorrosive effect on substrates. (see col. 7, lines 8-31)

Concerning the claimed corrosion inhibitor, Tanabe teaches the following:

Exemplary aromatic hydroxyl compounds include phenol, cresol, xyleneol, pyrocatechol(=1,2-dihydroxybenzene), tertbutylcatechol, resorcinol, hydroquinone, pyrogallol, 1,2,4-benzenetriol, p-hydroxybenzyl alcohol, o-hydroxybenzyl alcohol, p-hydroxyphenethyl alcohol, p-aminophenol, m-aminophenol, diaminophenol, aminoresorcinol, p-hydroxybenzoic acid,



Art Unit: 1751

o-hydroxybenzoic acid, 2,4-dihydroxybenzoic acid, 2,5-dihydroxybenzoic acid, 3,4-dihydroxybenzoic acid(.dbd.protocatechuic acid), 3,5-dihydroxybenzoic acid and gallic acid.(see col. 5, lines 1-10)

Concerning the alternative corrosion inhibitors, Tanabe teaches the following:

Specific examples of the benzotriazole-based compounds include benzotriazole, 5,6-dimethylbenzotriazole, 1-hydroxybenzotriazole, 1-methylbenzotriazole, 1-aminobenzotriazole, 1-phenylbenzo-triazole, 1-hydroxymethylbenzotriazole, 1-benzotriazole-methyl carboxylate, 5-benzotriazole-carboxylic acid, 1-methoxy-benzotriazole, 1-(2,2-dihydroxyethyl)benzotriazole, 1-(1,2-dihydroxypropyl)benzotriazole and 1-(2,3-dihydroxypropyl)benzotriazole, etc. Among these, benzotriazole, 1-hydroxybenzotriazole, 1-methoxy-benzotriazole, 1-(2,2-dihydroxyethyl)benzotriazole, 1-(1,2-dihydroxypropyl benzotriazole and 1-(2,3-dihydroxypropyl)benzotriazole are preferably used, and benzotriazole and 1-(1,<sup>sup.2</sup>-dihydroxypropyl)benzotriazole are more preferred. These benzotriazole-based compounds may used either independently or in combination with themselves.(see col. 8, lines 28-46)

Concerning the preferred substrate, Tanabe teaches the following:

In the current fabrication process of semiconductor devices and liquid-crystal devices, dry etching, ashing, ion implantation and other post-treatments are applied to photoresist films, and that it becomes necessary to strip thusly treated photoresist films. Due to those

Art Unit: 1751

post-treatments, the photoresist films become modified or deteriorated in nature. With the recent increase in the strictness of the conditions for these post-treatments, the nature of the deteriorated photoresist films tends to become inorganic than organic and, as a result, the liquid strippers using alkanolamines have turned out to be inadequate for the purpose of stripping the deteriorated photoresist films.(see col. 1, lines 43-53)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregory E. Webb  
Primary Examiner  
Art Unit 1751

gew

Application/Control Number: 10/689,620

Page 18

Art Unit: 1751